

EXHIBIT 2

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

NETLIST, INC.,

Plaintiff,

v.

MICRON TECHNOLOGY, INC., MICRON SEMICONDUCTOR PRODUCTS, INC., AND MICRON TECHNOLOGY TEXAS LLC,

Defendants.

CIVIL ACTION NO. 2:22-cv-00203-JRG

JURY TRIAL DEMANDED

**PLAINTIFF NETLIST, INC.’S FIRST SET OF INTERROGATORIES
TO DEFENDANTS (NOS. 1–23)**

Pursuant to Rules 26 and 33 of the Federal Rules of Civil Procedure, Plaintiff Netlist, Inc. (“Netlist”) directs the following interrogatories to defendants Micron Technology, Inc., Micron Semiconductor Products, Inc., and Micron Technology Texas LLC (collectively “Micron” or “Defendants”) to be answered no later than thirty (30) days from the date thereof.

DEFINITIONS

1. Unless the context indicates otherwise, for purposes of these discovery requests, the following words and phrases have the meanings given:
2. “Micron,” “Defendant(s),” “You,” or “Your” means Micron Technology, Inc. (“Micron Technology”), Micron Semiconductor Products, Inc. (“Micron Semiconductor”), and Micron Technology Texas LLC (“Micron Texas”) and all affiliates, related entities, parents, branches, subsidiaries or divisions, and any predecessor or successor entities and any of its or their present or former officers, directors, agents, attorneys, consultants, accountants, employees, representatives, investigators, distributors, salespersons, sales representatives, licensors, licensees, and any other persons acting or purporting to act for or on its or their behalf or under

its or their control, including but not limited to experts or persons consulted concerning any factual matter or matters of opinion relating to any issues involved in the action.

3. “Netlist” shall mean Plaintiff Netlist, Inc. and all of its affiliates, officers, employees, agents, representatives, contractors, consultants, attorneys, successors, and assigns.

4. “Patent” means any United States, international, or foreign classes or types of patents, utility models, design patents, applications (including provisional applications), certificates of invention, reissues, divisionals, continuations, continuations-in-part, extensions, renewals, reexaminations and foreign counterparts thereof. The defined term Patent includes all stated categories of intellectual property regardless of whether those rights are presently expired or were ever adjudged invalid.

5. “Netlist Patents-in-Suit” means and refers to, both individually and collectively, U.S. Patent Nos. 10,860,506 (“’506 Patent”), 10,949,339 (“’339 Patent”), 11,016,918 (“’918 Patent”), 11,232,054 (“’054 Patent”), 8,787,060 (“’060 Patent”), and 9,318,160 (“’160 Patent”), as well as all applications and patents that share a common priority claim. The applications and patents that share a common priority claim include but are not limited to those listed in the table below:

Country	Application Number	Publication Number	Patent Number
US	16/391,151	2019-0347220	10,860,506
US	13/952,599	2014-0337539	9,128,632
US	14/846,993	2016-0034408	9,563,587
US	15/426,064	2017-0147514	9,824,035
US	15/820,076	2018-0095908	10,268,608
US	15/470,856	2017/0337125	10,949,339

US	12/504,131	2011-0016269	8,417,870
US	12/761,179	2011-0016250	8,516,185
US	13/970,606	2014-0040568	9,606,907
US	17/138,766	2021-0124701	11,016,918
US	17/328,019	2021-0279194	11,232,054
US	13/288,850	2012-010622	8,787,060
US	14/337,168	2015-0070959	9,318,160
US	15/095,288	2016-022541	9,659,601
US	15/602,099	2017-0256291	10,290,328

6. “Third party” means any individual, entity, organization, partnership, or corporation that is not a party to this action.

7. “Prior Art” is used in the same manner in which the term is used in pre-AIA 35 U.S.C. §§ 102 and 103, and includes any patent, printed publication, system, prior knowledge, prior use, prior sale, offer of sale, or other act or event relevant to patentability under 35 U.S.C. §§ 102 or 103, or that You otherwise assert renders any asserted claim invalid.

8. “Micron Accused DDR4 LRDIMMs” shall include any and all Micron Double Data Rate 4 (“DDR4”) load-reduced dual in-line memory modules (“LRDIMMs”), including ones that its customers further customize.

9. “Micron Accused DDR5 DIMMs” shall include any and all Micron Double Data Rate 5 (“DDR5”) dual in-line memory modules, including ones that its customers further customize.

10. “Micron Accused HBM Products” shall include any and all Micron HBM2, HBM2E, or HMB3 high bandwidth memory products, including ones that its customers further customize.

11. “Micron Accused Products” shall mean any and all Micron Accused DDR4 LRDIMMs, Micron Accused DDR5 DIMMs, and Micron Accused HBM Products.

12. “Micron Distributor” shall include any person who Micron authorized to sell any Micron Accused Products.

13. “RCD” means register clock drivers (“RCD”) for use in Micron Accused DDR4 LRDIMMs.

14. “DDR4 LRDIMM Write Buffer Timing Control Features” includes the following: (1) the tristate buffers in each Data Buffer for a write operation (“Write Tristate Buffers”); (2) the time period during which Write Tristate Buffers are enabled to drive write data to one or more associated data lines connecting to one or more associated DRAMs and the time period during which the Write Tristate Buffers are disabled; (3) latency if any used to determine the time period(s) in (2); (4) signals generated by the RCD in association with driving write data from a DDR4 LRDIMM data buffer to a DRAM and enablement of Write Tristate Buffers, and associated circuitry; (5) signals received by and generated by the RCD in association with a write operation, and associated circuitry; and (6) the number of bits passing through Write Tristate Buffers during each enablement period to a respective DRAM.

15. “DDR4 LRDIMM Read Buffer Timing Control Features” includes the following: (1) signals generated by the RCD in association with sampling and transmitting read data by a data buffer and associated circuitry; (2) amount of read strobe delay by the Data Buffer in response to one or more signals in (1); (3) mechanisms by which the Data Buffer determines the

amount of delay to be applied to a read strobe, and signals and circuitry associated therewith; (4) clock signals received or outputted by the Data Buffer and the RCD and associated circuitry; (5) the width of the read data for each Data Buffer; (6) the tristate buffers in each Data Buffer for a read operation (“Read Tristate Buffers”) and the time period during which each Read Tristate Buffer is enabled to drive read data to a memory controller of a host system and the period during which the Read Tristate Buffer is disabled; and (7) determination of any latency associated with (6).

16. “DDR5 Power Management Features” means features related to DDR5 DIMMs’ on-board power management and voltage regulation functionality, including but not limited to (1) input voltage monitoring and regulation, including in response to over-voltage and under-voltage detection, (2) output voltage regulation and monitoring, the associated target output voltage for each voltage regulator (whether linear or switch mode) and the selective switching on or off of an output power supply; and (3) mechanisms and algorithms for input voltage regulation, including signals generated, power supply switch and register value update in response to detection of over-voltage or under-voltage for input voltage.

17. “HBM Load Reduction Features” means features related to the reduction of capacitive load in high-bandwidth memory products, including but not limited to (1) the arrangement of the TSVs (i.e., any structures allowing for electrical communication between the buffer die and some but not all core dies) and (2) enablement/disablement of TSV drivers in the buffer die.

18. “Patented Features” means one or more of DDR4 LRDIMM Write Buffer Timing Control Features, DDR4 LRDIMM Read Buffer Timing Control Features, DDR5 Power Management Features, and HBM Load Reduction Features.

19. “Standard(s)” means any technical standard created, authorized, controlled, and/or developed privately or unilaterally by a corporation, consortium, regulatory body, government, or standards-setting organization.

20. “JEDEC” means the JEDEC Solid State Technology Association.

21. “Person” refers to any natural individual; any form of business entity including, but not limited to, any corporation, company, firm, general partnership, limited partnership, limited liability company, joint venture, proprietorship, business association, association, foundation, and legal entity; any directors, officers, owners, members, employees, agents, representatives, and attorneys of any of the foregoing; anyone else purporting to act on behalf of any such natural person or business entity; or any government entity, agency, officer, department, or affiliate.

22. “Specification” means all Documents or Things that discuss, illustrate, define, or reflect, in whole or in part, any aspect of how something is or should be made, inspected, or tested. Specifications include, for example, layout-design (topography) documents, textual documents, drawings, mask files, circuit diagrams, block diagrams, flow diagrams, product specifications, functional specifications, internal design and development specifications, architectural manuals, user manuals, programmer’s guides, manufacturing process specifications, material specifications, assembly specifications, blueprints, and/or illustrations.

23. “Source Code” means a complete copy of the referenced source codes for RTL code, firmware, middleware, or software.

24. “Including” and “include” mean including without limitation, whether or not the phrase “without limitation” is explicitly stated.

25. The words "and" and "or" are terms of inclusion and not of exclusion and are to be construed conjunctively or disjunctively as necessary to bring within the scope of these requests for production any information which might otherwise be construed to be outside their scope.

26. The term "any" shall mean "any and all" and the term "all" shall mean "any and all."

27. "Date" means the exact day, month, and year if so ascertainable, or if not, the best approximation (including relationship to seasons and other events).

28. "Document" means any form of communication or representation, in any language fixed in any tangible medium, including every form of recording letters, words, pictures, sounds, or symbols, or combinations thereof by means such as handwriting, printing, photostatting, photographing, magnetic taping or writing, optically burning or encoding, or any other form of storing, compiling, or mechanically or electrically recording data onto any media including paper, film, plastic, magnetic tape, computer disks, compact discs (CDs), digital video discs (DVDs) and the like. For example, the term "Document" includes, without limitation, correspondence, memoranda, notes, diaries, minutes, statistics, letters, telegrams, contracts, reports, studies, checks, statements, tags, labels, invoices, brochures, periodicals, receipts, returns, summaries, pamphlets, books, notebooks, lab notebooks, invention disclosures, prospectuses, interoffice, and intra-office communications, offers, notations of any sort of conversations, working papers, applications, permits, surveys, indices, telephone calls, meetings, printouts, teletypes, telefax, telefax records, invoices, work sheets, graphic or oral representations of any kind (including without limitation, pictures, photographs, charts, microfiche, microfilm, videotape, audiotape, recordings, motion pictures, plans, drawings, surveys), and electronic or mechanical records or

representations of any kind (including, without limitation, electronic mail or e-mail, Instant Messages, tapes, cassettes, discs, and recordings).

29. Every draft, version, revision, or non-identical copy of a “Document,” including copies that differ from the original because of hand notation(s), shall be considered a separate “Document,” as that term is used herein, but exhibits, appendices, and attachments to a “Document” shall be considered part of the “Document” itself.

30. “Communications” means all written, oral, telephonic, or other inquiries, dialogues, discussions, conversations, interviews, correspondence, consultations, negotiations, agreements, understandings, meetings, letters, notes, advertisements, e-mails, and all other Documents evidencing any transmittal of information or verbal or nonverbal interaction between persons and entities.

31. “Thing” means any tangible item, including, without limitation, models, prototypes, and samples of any device, apparatus, or product.

32. The terms “relate to,” “reflecting,” “relating to,” “concerning,” or any variations thereof, shall mean relating to, referring to, concerning, mentioning, reflecting, regarding, pertaining to, evidencing, involving, describing, discussing, commenting on, embodying, responding to, supporting, contradicting, constituting (in whole or in part), or between (as in the context of Communications), as the context makes appropriate.

INSTRUCTIONS

1. All Interrogatories must be answered fully and in writing in accordance with Rules 11 and 33 of the Federal Rules of Civil Procedure.

2. Each of the Interrogatory requests (the “Requests”) shall operate and be responded to independently and, unless otherwise indicated, no Request limits the scope of any other Request.

3. Where knowledge or information in Your possession is requested, the request extends to knowledge or information in the possession of Your predecessors and/or successors, as well as to information in the possession of Your officers, directors, agents, employees, representatives and, unless privileged, attorneys. Whenever an answer to these Requests contains information that is not based upon Your personal knowledge, state the source and nature of such information.

4. Words appearing in singular form, including defined terms, shall also be construed as plural, and words appearing in plural form, including defined terms, shall also be construed as singular so as to give each discovery request its broadest possible meaning and to bring within the scope of the discovery request all information that otherwise might be construed to be outside its scope.

5. Whenever appropriate, verb tenses shall be interpreted to include past, present, and future tenses, and words imparting the masculine include the feminine and vice versa.

6. The Definitions apply regardless of capitalization.

7. “Identify” shall include, among other applicable identifying information:

(a) in connection with natural persons, their full names, titles, and job descriptions, and their present or last known business addresses and residences (designating whether a given address is a present address or last known address and whether a given address is a business or residential address);

(b) in connection with firms, partnerships, corporations, proprietorships,

associations, or other entities, their name, and their present or last known addresses of the principal place of business (designating whether the address is a present or last known address);

- (c) in connection with Documents, a description of the Document, setting forth its Date, title, author or over whose name it issued, the addressee, parties thereto, the substance, and the present custodian thereof, with such reasonable particularity as would be sufficient to permit the Document to be sought by subpoena *duces tecum* or under the provisions of Rule 34 of the Federal Rules of Civil Procedure;
- (d) in connection with oral statements and Communications: (i) the Date and location where they were made; (ii) the identity of each of the participants and witnesses thereto, and all others present; (iii) the medium of Communication; and (iv) their substance.

8. The term “Describe” when used with reference to a technology means to (a) describe it with specificity; (b) identify all uses You have made, are making, or plan to make of it; (c) describe each system, service, method, or apparatus (including any research or engineering project) developed, made, used, imported, sold, or offered for sale in the United States by You, or that You intend to develop, make, use, import, sell, or offer for sale in the United States, that uses it; and (d) identify all internal or commercial names or designations.

9. “Set Forth Your Complete Basis” for a particular contention or allegation means to identify and comprehensively describe in detail its legal and factual basis, including the identity of all Persons with knowledge of the factual basis and the identity of all evidence, including Documents (by production number), oral statements, and witnesses that relate to it. If the

contention or allegation relates to a comparison between patent claims and other subject matter, set forth the basis for the contention or allegation in claim chart form on an element-by-element basis. If the conduct of any Third Party is relevant to any portion of this answer, please identify such Third Party and comprehensively describe in detail that party's relevant conduct.

10. If, in responding to any Interrogatory, You elect to produce business records pursuant to Rule 33(d) of the Federal Rules of Civil Procedure, specify the particular records from which the answer may be derived or ascertained in sufficient details to permit Netlist to locate and identify the precise pages or records from which the answer may be ascertained as readily as You may ascertain such an answer.

11. If any document referred to in Your responses to these Interrogatories was, but is no longer, in Your possession, custody, or control, state that disposition was made with each document and when such disposition was made. In the event that any Document or Thing or portion thereof called for by this set of requests is known to have been lost or destroyed (either as a result of a Document destruction policy or otherwise), provide a written statement setting forth the following information for each such item: (1) the nature of the item (e.g., letter, memorandum, chart, engineering drawing, etc.); (2) the identity of each sender(s), author(s), and recipient(s) of the item, whether indicated as such or not on the item; (3) the Date that the item was created, or if there is no record of this information, the approximate Date; (4) a description of the subject matter of the item; (5) if the item is a Document, the number of pages; (6) information regarding whether any attachments or appendices to the item exist or existed, along with a description of any such attachments or appendices; and (7) the circumstances of the loss or destruction of the item including the Date of destruction or loss, the identity of the Person(s) who lost or destroyed

the item, and if the item was destroyed, the identity of the Person(s) who authorized the destruction.

12. If You do not answer any Interrogatory in full, state the precise reason for failing to do so. If a legal objection is made, set forth the specific nature of the grounds for the objection. If only a portion of any Interrogatory cannot or will not be answered, (i) provide a full answer to the remaining portion; and (ii) specifically set forth (a) the fact that the answer is incomplete and (b) the reasons or grounds for any omission or for Your inability or refusal to complete the answer. If an Interrogatory can be answered only in part on the basis of information available at the time of the response, (i) provide an answer on the basis of that information; (ii) indicate that Your answer is so limited; and (iii) provide a further response, in accordance with these Instructions, when further information becomes available.

13. If You contend that any Interrogatory seeks information, in whole or in part, that is protected by a legal privilege or other doctrine which precludes disclosure thereof, identify the legal privilege and/or doctrine with particularity, including all supporting facts and each person having knowledge of the factual basis for the assertion.

14. You are required to supplement or amend Your responses to these Interrogatories as the need arises pursuant to Rule 26 of the Federal Rules of Civil Procedure.

INTERROGATORIES

INTERROGATORY NO. 1:

For each asserted claim of Netlist Patents-in-Suit that You deny liability for infringement or damages, Set Forth Your Complete Basis (including both factual and legal) for that denial on a product-by-product and element-by-element basis, including but not limited to, all claim elements that You assert are not met by that Micron Accused Product, the reason for Your

assertion that such elements are not met (such as by describing how each of Your products are configured to operate and/or actually operate), any affirmative defense(s) that You intend to assert with respect to that Micron Accused Product, and the factual basis supporting Your belief that such affirmative defense(s) apply.

INTERROGATORY NO. 2:

Separately identify each Micron Accused Product made, used, offered for sale, or sold by You or at Your direction since June 10, 2016, and up through trial in this matter. Your identification of each Micron Accused Product should include (a) each product's name; (b) internal model number, external model number, part number, internal name, SKU, and any other unique identifier of the product; (c) Date first made, used, sold or offered for sale; and (d) the identification of Supplier(s) for any component(s) in the Micron Accused Products (such as registering clock drivers, data buffers, DDR5 power management circuitry, SPD) that You assert are not made, assembled, or designed by You. To the extent that any Micron Accused Product changed between the time of its introduction and the first day of trial in this matter, separately list each version/model and the first Date and last Date corresponding to each version/model. Your answer should use the format of the following table. This interrogatory is not limited to only the Micron Accused Products You contend are made, used, sold, offered for sale, or imported in the United States, because this will be an issue of disputed fact, and Netlist is entitled to the full discovery into what satisfies that requirement.

Product Name	Unique Product Identifier	Date First Made by You	Date First Used by You	Date first Offered for Sale	Entity Offering for Sale	Date First Sold	Total Sales To-Date	3 rd Party Components Used	3 rd Party Component Supplier(s)

INTERROGATORY NO. 3:

For each Micron Accused Product identified in Interrogatory No. 2, Identify the five persons most knowledgeable regarding the following (including his or her role, position, location, and contact information): (i) design, development, and operation of the Micron Accused Product; (ii) the relevant components in the Micron Accused Product; (iii) the operation and function of the relevant components in the Micron Accused Product; (iv) the manufacture of the Micron Accused Product; and (v) sales, marketing, importation and exportation of the Micron Accused Product.

INTERROGATORY NO. 4:

On a monthly basis beginning June 10, 2016, state the total number of units made, sold, used, or offered for sale, gross revenue, average revenue, operating revenue, net revenue, gross profit, operating profit, net profit, profit margin, the country or countries in which the unit was made, the country or countries in which any contract or invoice relating to the product was sent to or received from, the country or countries that the products were shipped to, the purchaser (including both the direct and indirect purchaser) and costs associated with each Micron Accused Product identified in response to Interrogatory No. 2, on a product-by-product basis. This interrogatory is not limited to the products You contend are made, used, sold, offered for sale, or imported in the United States, because this will be an issue of disputed fact, and Netlist is entitled to the full discovery into what satisfies that requirement.

INTERROGATORY NO. 5:

For each Netlist Patent-in-Suit, describe in detail the facts and circumstances regarding Your first awareness of the Netlist Patent-in-Suit, including (i) when You first became aware of the Netlist Patent-in-Suit, (ii) how You first became aware of the Netlist Patent-in-Suit, (iii) the identity of the individual(s) who first became aware of the Netlist Patent-in-Suit, (iv) the actions,

if any, taken by You after becoming aware of the Netlist Patent-in-Suit, (v) the reason for such action or non-action, (vi) persons involved in deciding the course of action (or non-action) after learning of the Netlist Patent-in-Suit and the roles they played in the decision-making, and (vii) an identification of all documents showing or reflecting awareness of the Netlist Patent-in-Suit.

INTERROGATORY NO. 6:

Identify the specific sections of the JEDEC Standards implemented by Micron's Accused Products and Set Forth Your Complete Basis for that conclusion.

INTERROGATORY NO. 7:

For each license agreement that You believe is relevant to a reasonable royalty analysis, identify the license agreement, Your interpretation of the royalty rate and structure set forth in the license agreement, and all factual and legal bases for why it is (or is not) a comparable license.

INTERROGATORY NO. 8:

For each Netlist Patent-in-Suit, identify and describe in detail any alleged non-infringing alternative that You contend exists or existed to each Netlist Patent-in-Suit or alternatives that you considered implementing, including but not limited to: (i) a description of each alleged non-infringing alternative; (ii) a description of when and how each alleged non-infringing alternative was developed or otherwise available; (iii) the identity of individuals involved in developing and/or most knowledgeable about each alleged non-infringing alternative (if applicable); (iv) costs associated with developing and implementing each alleged non-infringing alternative; (v) steps and the time required to develop and implement each alleged non-infringing alternative; (vi) Dates when each alleged non-infringing alternative was incorporated in an accused product or a

commercial product (if applicable); (vii) any known patents covering the alleged non-infringing alternatives; (viii) the acceptability of the alleged non-infringing alternatives (including the differences in performance and costs between the alternative and the asserted claims, and consumers' acceptance of such differences); (ix) any reason(s) for not replacing a current product with the alleged non-infringing alternative; (x) the identity of individuals involved in supporting the reason(s) for not replacing current products with alternatives; and (xi) any other evidence that supports Your belief that the alternative is/was viable from a technical and business perspective.

INTERROGATORY NO. 9:

For each asserted claim of Netlist Patents-in-Suit that You assert Your liability for infringement is limited, Set Forth Your Complete Basis for Your assertion, including any allegation that Your conduct is licensed or that Your behavior is not an act of making, using, offering for sale, or selling in the United States.

INTERROGATORY NO. 10:

Set Forth Your Complete Basis for your affirmative defenses.

INTERROGATORY NO. 11:

Separately for each Micron Accused Product, describe any consideration You have paid or received in connection with any transaction or agreement related to the Micron Accused Product (including purchases, sales agreements, cross licenses, technology transfer agreements, patent licenses, or litigation settlement agreements).

INTERROGATORY NO. 12:

Set Forth the Complete Basis for Your position regarding the theories, amounts, and methods of calculating the damages to which Netlist will be entitled if Micron is found to infringe

each Asserted Patent. For the avoidance of doubt, Your answer should include an analysis under the *Georgia-Pacific* factors and a description of at least the following categories of information: (1) any reasonable royalty that You contend would be appropriate; (2) any apportionment that You contend should be used to determine damages; (3) the royalty base that You contend should be used to determine damages; (4) the royalty rate that You contend should apply to the royalty base; and (5) all facts that support Your answer. Your answer should also include an analysis for Micron's proposed RAND royalty calculation to the extent Micron contends that any Netlist Patents-in-Suit are essential to practicing a standard.

INTERROGATORY NO. 13:

Set Forth the Complete Basis for any contention that Your infringement of each of Netlist's Patents-in-Suit is not willful, including an analysis of the willfulness evaluation factors set forth in *Read Corp. v. Portec, Inc.*, 970 F.2d 816 (Fed. Cir. 1992).

INTERROGATORY NO. 14:

Identify the role played by any Micron employees in JEDEC meetings regarding the design and function of the PMIC present on DDR5 modules, the adoption of distributed buffers in DDR4 LRDIMMs, or the adoption of the Advanced Memory Buffer ("AMB") for DDR2 FBDIMMs, and the Micron employees who first defined these features on Micron DDR5 products, Micron NVDIMM products, Micron FBDIMMs, or Micron LRDIMMs.

INTERROGATORY NO. 15:

Describe any customer demand, request, discussion, interest, and requirements for Micron Accused Products in connection with the Patented Features.

INTERROGATORY NO. 16:

For each Micron Accused Product, describe its competitive advantages, including: (1) the identity of any products You view as competing products; (2) the manufacturer(s) of such competing products; (3) advantages, importance, and/or disadvantages of Micron's products compared with those of Your competitors, including any value Micron asserts is attributable to Micron Accused Products separate from the Patented Features; (4) the market share of Micron's Accused Products; and (5) other valuation or assessment in Your possession, custody, or control conducted on each Micron Accused Product.

INTERROGATORY NO. 17:

For each DDR4 LRDIMM accused product, describe its structure, function and operation, including but not limited to any buffer control words that affect the timing of the data for a write operation as it passes through a data buffer, including how the buffer control words affect when the data path for the write path through the data buffer is enabled or disabled, how the buffer control words affect the operation of the write FIFO on the data path, how the buffer control words affect the enablement or disablement of tristate buffers on the data path and the timing of the enablement/disablement, how the buffer control words affect the operation of the transmitters and receivers on the data path, and why the data path for the write data in the data buffer is turned off between write operations.

INTERROGATORY NO. 18:

For each PMIC used in Micron Accused DDR5 DIMMs, describe its structure, function and operation, including but not limited to identifying the voltage source (including identifying the circuit that produces the voltage, the input to that circuit, and the output to the circuit) for (i) each non-PMIC component on the DDR5 DIMMs and (ii) each PMIC functional block; and (iii) to the extent that voltage sources may change depending on the different operating conditions,

identify any such changes in voltage source(s) (including identifying the circuit that produces the voltage, the input to that circuit and the output to the circuit), the conditions that trigger those changes; (iv) input voltage over-voltage and under-voltage monitoring and circuits involved in the monitoring; (v) sequences of events upon detecting input over-voltage or under-voltage conditions, including but not limited to signals generated by the voltage monitoring circuit, how the signals are propagated or transferred to other parts of the power management IC, the volatile or non-volatile registers or MTP memory spaces that are updated, the voltage regulators that are affected by the input overvoltage or under-voltage conditions, and the components on the module whose voltage supplies or operations are affected by the over-voltage or under-voltage of the input voltage(s).

INTERROGATORY NO. 19:

For each Micron NVDIMM products, describe in complete detail all power management features, including but not limited to (1) input voltage monitoring and regulation, including in response to over-voltage and under-voltage detection, (2) output voltage regulation and monitoring, the associated target output voltage for each voltage regulator (whether linear or switch mode) and the selective switching on or off of an output power supply; and (3) mechanisms and algorithms for input voltage regulation, including signals generated, power supply switch and register value update in response to detection of over-voltage or under-voltage for input voltage.

INTERROGATORY NO. 20:

Describe in detail the TSV configurations in Micron's Accused HBM Products, including the electrical connection between each TSV and each DRAM die or control/buffer die.

INTERROGATORY NO. 21:

Describe in detail the read, write, and repair operations in Micron Accused HBM Products, including (i) signals that are received by the buffer die (including signals used for selecting specific dies/chips, channels, or pseudo-channels in an Accused HBM Product), and terminals that receive such signals; (ii) signals generated by the buffer die in response and their functionality; (iii) signals transmitted from the buffer die to the core die(s) in response to command/address signals received by the buffer die; (iv) the enablement/disablement of TSV drivers in buffer die associated with channels (or pseudo-channels) selected for a read/write/repair operation, including all signals involved therein; (v) the enablement/disablement of TSV drivers in buffer die associated with channels (or pseudo-channels) not selected for a read, write, or repair operation, including all signals involved therein; (vi) enablement/disablement of TSV drivers in core die associated with channels (or pseudo-channels) selected for a read, write, or repair operation, including all signals involved therein; (vii) enablement/disablement of TSV drivers in core die associated with channels (or pseudo-channels) not selected for a read, write, repair operation, including all signals involved therein. If the operations or signals for a given state of operation differ depending on what the previous operation was, describe each scenario separately. For example, if the operation or signals for a read operation in Micron Accused HBM Products differ based on whether the previous operation was a read or a write operation, describe these differences in detail. Likewise, if the operation or signals for a write operation in Micron Accused HBM Products differ based on whether the previous operation was a read or a write operation, describe these differences in detail.

INTERROGATORY NO. 22:

Describe read operations in Micron's Accused DDR4 LRDIMMs, including (i) the signals received and sent by each component on the memory module; (ii) the electrical lines on which

the signals are transmitted; (iii) the amount of delay that is applied to MDQS in a read operation; (iv) the buffer control words containing the information on the amount of delay described in (iii); (v) how the data buffer receives the value(s) of the control words of (iv); (vi) the mechanism by which data paths via which read data is transmitted through the data buffer (“read data paths”) are enabled and disabled; (vii) the period during which the read data paths are enabled; (viii) the period during which the read paths are disabled; (ix) the signals and parameters used to control the enablement and disablement of the read data paths through the data buffer.

INTERROGATORY NO. 23:

Describe the write operations in Micron’s Accused DDR4 RDIMMs, including (i) the signals received and sent by each component on the DIMMs; (ii) the electrical lines on which the signals are transmitted; (iii) the mechanism by which write data paths via which write data is transmitted through the data buffer (“write data paths”) are enabled and disabled; (iv) the period during which the write data paths are enabled; (v) the period during which the write data paths are enabled or disabled; and (vi) the signals and parameters used to control the enablement and disablement of the read data paths through the data buffer.

Dated: January 11, 2023

Respectfully submitted,

/s/ Thomas C. Werner

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CERTIFICATE OF SERVICE

I hereby certify that, on January 11, 2023, a copy of the foregoing was served to all counsel of record.

/s/ Thomas C. Werner
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